

## How to achieve cost savings and strategic performance in purchasing simultaneously: a knowledge-based view

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# **How to achieve cost savings and strategic performance in purchasing simultaneously: A knowledge-based view**

## **Abstract**

The competitive advantage purchasing provides has been debated for decades. For a novel perspective we derive a theoretical framework grounded in the knowledge-based view in order to examine how purchasing knowledge and purchasing integration impact cost and strategic performance. The derived hypotheses are tested based on extensive secondary data from a large European multinational utility company. The 179 studied ‘purchasing-internal client relationships’ contain real contracted savings data and internal client ratings of purchasing knowledge, purchasing integration and strategic purchasing performance. We show that purchasing knowledge is a major antecedent for both savings and strategic purchasing performance. This effect is further amplified by purchasing integration. With this study, we extend the understanding of the purchasing knowledge–performance link. We conclude that purchasing knowledge becomes particularly valuable when combined with other functions’ processes through purchasing integration. This causal chain is also supported through general knowledge-based view theory. Moreover, we provide numerical evidence of the value of knowledge creation and integration processes to purchasing professionals in our managerial implications based on results obtained from actual purchasing savings data.

*Keywords:* Purchasing performance, Savings, Strategic purchasing, Purchasing knowledge, Purchasing integration, Knowledge-based view

## **1. Introduction**

“Purchasing is indeed strategic” (Carter and Narasimhan, 1996, p.20). For years, the purchasing literature has debated the importance and contribution of purchasing to firm

strategy and performance (Carter and Monczka, 1978; González-Benito, 2007; Reck and Long, 1988). It is widely recognized that well-performing purchasing creates value, enhancing a firm's operational, financial and market performance (Carr and Smeltzer, 1999a; Foerstl et al., 2016; Narasimhan and Das, 2001; Williamson, 2008). A major focus within this debate has been the increasing strategic role of purchasing, which developed from the initial operative buying function (Andersen and Rask, 2003; Carter and Narasimhan, 1996; Ellram and Carr, 1994; Rozemeijer, 2008). Often, this discussion has been controversial, as the debate between Ramsay (2001) and Mol (2003) on the relevance of purchasing regarding strategic management showed. Moreover, empirical evidence illustrates the increasing contribution of strategic purchasing to firm performance in recent years (Chen et al., 2004; Zimmermann and Foerstl, 2014; Tchokogué, Nollet and Robineau, 2017).

Nevertheless, scholars and practitioners alike still consider pure cost savings as purchasing's main contribution (Hartmann et al., 2012; Narasimhan and Das, 2001). Especially in the recent – uncertain and ambiguous – global economic situation, the primary objective of purchasing is to optimize cost structures, especially given the increasing supply value chain disaggregation and the rising ratio in external spend compared to internal costs (Schiele, 2007). Therefore, the question arises: How can high cost savings be achieved while simultaneously increasing purchasing's performance along other strategic priorities such as responsiveness or innovation? Achieving cost savings usually is seen as a tactical and short-term task that is simple to measure and communicate (Schiele, 2007). Strategic performance, however, builds on the ability of purchasing to act with a long-term perspective with effects becoming apparent sometimes only years after action.

To create sustainable competitive advantage and to outperform competitors, both performance dimensions might need to coexist. Rooted in the knowledge-based view of the firm (Kogut and Zander, 1992; Grant, 1996) the presence and the right configuration of

knowledge lead to higher levels of performance in general (Barney, 1991). For purchasing performance (in terms of cost savings and strategy), we expect purchasing knowledge to play a decisive role. For purchasing functions, several dimensions of knowledge (such as supplier market, technical, and commercial knowledge) exist and enhance strategic contributions (Carr and Smeltzer, 2000; Cousins et al., 2006; Keough, 1993), as well as positively influence cost savings (Schiele, 2007). Hence, knowledge might also be the essential underlying factor explaining the simultaneous presence of both, savings performance and strategic purchasing performance. Thus, the overarching research questions of the article are the following:

- (1) To what extent can purchasing knowledge enhance the strategic performance and the savings performance of purchasing simultaneously?*
- (2) How do strategic purchasing performance and savings performance relate to each other?*

Our approach to answer these questions relies on extensive secondary data from a large European energy company covering savings initiatives on external expenditures of more than EUR 3 billion. We use two existing data sources: 179 responses to a purchasing satisfaction survey conducted in 2015 collected from purchasing's internal clients as well as a company database that contains more than 1,000 concrete savings initiatives in the form of real contracted savings (in line with the works of Schiele et al. (2011) and Van Poucke et al. (2016)). Matching the two sources of information provided the opportunity to identify the actual drivers of hard and objectified savings performance. Using regression analysis, this study provides insights into how strategic purchasing performance enhances savings performance and how purchasing knowledge is an underlying driver of both performance dimensions. Furthermore, we identify purchasing integration as an important moderator.

The contribution of this article in this context is threefold. First, the data set contains cost savings in their narrowest definition of real, contracted savings. Usually, the evaluation of

cost savings is based on subjective interviews with perceptual scales and reported as soft savings, leaving room for individual interpretation (Nollet et al., 2008). This subjectivity is prevented using hard savings data from a firm's database that reports real contracted savings. Second, we investigate not only the drivers of strategic purchasing performance but also the resulting contribution of strategic purchasing performance itself. Extensive literature has evaluated the role of strategic purchasing for overall buying firm performance (Cousins et al., 2006). However, we provide insights into the direct financial impact via the savings performance of the purchasing function. Third, by surveying purchasing's internal client, we evaluate its strategic performance from outside the function (Ellram and Carr, 1994) as the strategic contribution of purchasing depends on its value contribution to its internal clients (Carter and Narasimhan, 1996). Moreover, with the extensive use secondary data (which is still rare in the purchasing domain), our study is also highly relevant for practitioners.

The article is organized as follows. First, we outline the existing literature, deriving the concrete constructs from items used in the survey. Then we introduce the research model based on the knowledge-based view and formulate six hypotheses. Next, we detail the methodology, elaborate on the data collection approach and measures, and present the results of the hypotheses testing. We end with a discussion of results, their implications for researchers and practice, and the potential limitations and avenues for further research.

## **2. Background**

### *2.1. Purchasing knowledge*

In the evolution of the purchasing function and its changing environment, the configuration of knowledge, skills, and competences of purchasing professionals have always played a significant role (Giunipero and Percy, 2000). Today, as the role of the function is becoming more strategic in many organizations (Faes et al., 2001), purchasing professionals'

job profiles have received a significant upgrade (Zheng et al., 2007). Purchasing's internal legitimacy is tied to the proficiency of purchasing practices where effect of explorative supply knowledge provision and buying firm performance whereas exploitative knowledge requires less internal statue to attain cost reductions (Kilpi, Lorentz, Solakivi and Malmsten, 2018). This upgrade in statue requires a new knowledge set, including the development of suppliers, market research, outsourcing activities, cost analysis, risk management, as well as commodity and sourcing strategies (Carr and Smeltzer, 2000; Cousins et al., 2006; Giunipero et al., 2005). In an era of digitalization, the evolution and extension of knowledge is increased further using interactive technologies and big data analysis that increase the efficiency and effectiveness of knowledge production and sharing (Bughin et al., 2010). A recent study by ABC made specific design recommendations for digitalization interventions of the purchasing function along the procurement value drivers and practices (Srai and Lorentz, 2019).

Purchasing knowledge and capability development is a widely-discussed field in the purchasing and supply management literature (Zheng et al., 2007), mostly rooted in the knowledge-based view. This perspective of an organization supports the belief that the intangible asset knowledge is a valuable resource of competitive advantage (Argote et al., 2003). Knowledge creates value in a unique, inimitable, and nontransferable way (Barney, 1991; Wernerfelt, 1984) to ensure efficiency and effectiveness through speed and quality simultaneously in purchasing (Carr and Pearson, 2002).

Literature extensively discusses purchasing knowledge, skills, and competences in the light of cost savings, as well as the strategic evolution of the function. Previous publications focused mainly on pure commercial aspects, such as negotiation skills, but mentioned the function's skill set as the main barrier to a more strategic role for purchasing (Keough, 1993; van Weele, 1984). Carr and Smeltzer (1997) specifically point out that purchasing professionals, in order to act strategically, need to have knowledge about supplier markets,

external supplier environments, knowledge of their internal business partners, and technical skills, as well as knowledge of the firm's overall strategic goals. Giunipero and Percy (2000) include additional knowledge aspects as the understanding of the firm's business and the overall market context in which the firm operates. Cousins et al. (2006) then explicitly brought purchasing knowledge (such as supplier market knowledge and tool skills) forward as the main differentiator between the performance of purchasing functions. PSMs strong internal interfaces create opportunities for knowledge combination, but also various hurdles prior to the supply market analysis and supplier integration, especially when seeking innovative solutions. A deeper analysis of purchasing's internal ties and their performance implications are required as they may change over time (Andersen and Gadde, 2019).

Similarly, many other publications reviewed the importance of specific knowledge for strategic contributions to a firm and its performance (Anderson and Katz, 1998; Carr and Smeltzer, 2000; Young and Varble, 1997) and point out the increasing importance of broadened purchasing knowledge as business environments change more intensely and quickly (Giunipero et al., 2005).

Many of these studies developed their own classification of knowledge and skills. Although the studies used different nomenclatures, they tie back to similar single aspects of knowledge (Tassabehji and Moorhouse, 2008). Previous studies focused on pure commercial and technical purchasing skills (Kolchin and Giunipero, 1993), which were later augmented with strategic knowledge as an important driver for the function's development (Giunipero and Percy, 2000). Giunipero et al. (2006) further emphasize this argument for the importance of specific strategic knowledge that supports the function's transformation. Different classifications of these skills exist. Carr and Smeltzer (2000) introduce a very holistic definition comprising 35 individual skills, and Tassabehji and Moorhouse (2008) use a five-category taxonomy.

Summarizing, the role of purchasing knowledge is important for strategic purchasing, and the effects are well documented. However, a wide and differing range of often very detailed taxonomies is used in the literature. As we investigate the contribution of the purchasing function's knowledge by asking internal business partners about adjacent functions, we aim for a taxonomy that is holistic but not too complex for non-purchasing professionals. Similar to Carr and Smeltzer (1997), we include the main overarching aspects and thus describe purchasing knowledge in terms of three aspects: technical knowledge and capabilities, knowledge of the supplier market, as well as the commercial knowledge required to improve the cost base vis-à-vis suppliers through negotiations, for example.

## *2.2. Purchasing integration*

The integration of different functions with one another has been recognized as a driver of the competitive advantage of firms leveraging advanced cross-functional strategic agreement (Hayes and Wheelwright, 1985). This concept is particularly appropriate for purchasing as it features many direct interfaces with other stakeholders and functions within a firm, such as manufacturing, logistics, R&D, marketing, or controlling (Pagell, 2004). Therefore, the integration of purchasing is important for firm performance and also key from a knowledge-based view as purchasing professionals develop specific skills over time also from sharing and exchanging knowledge internally for the creation of sustainable competitive advantage and performance (Glenn Richey and Autry, 2009; Malhotra et al., 2005). Legitimizing strategies depend on the type of internal client and, thus, the attainable performance contributions. In general, purchasing must implement internal collaborative and coordination mechanisms that generate knowledge and capabilities which cannot be easily duplicated by competitors (Tchokogué, Paché, Nollet and Stoleru 2017).

Integration in the context of purchasing is a widely used term, addressing alignment across hierarchy levels, with external and internal partners equally (Narasimhan and Das,



2001). Much of the literature focused on the first two aspects. This includes investigations of the performance implications of strategic alignment with senior management levels (González-Benito, 2007; Narasimhan and Das, 2001), as well as the integration of purchasing with external partners across the supply chain, a long-standing area of research (Armistead and Mapes, 1993; Evans et al., 1993; Stock and Lambert, 2001; Wisner and Tan, 2000). However, the insights into cross-functional integration within firms are limited (Pagell and Krause, 2002). A recent study reveals that the required level of purchasing's cross-functionality is contingent on purchasing category characteristics in order to derive desired levels of innovation and cost performance (Akin-Ates, van Raaij and Wynstra, 2018). Given the nature of the present study, which investigates the view of internal business partners (i.e. internal clients) on the purchasing function, we focus on this internal, cross-functional aspect. Purchasing integration aims at "aligning strategic purchasing practices with the firm's competitive priorities" (Narasimhan and Das, 2001, p. 594).

An earlier stream of literature on cross-function integration points to the importance of cross-functional interaction for defining a coherent strategy (Spekman and Hill, 1980). This earlier stream expanded to the purchasing literature and is an essential part of the discussion about the development of purchasing from clerical activities to a mature and strategic function (Bhote, 1989; Freeman and Cavinato, 1990; Reck and Long, 1988). Most of the following discussions built on this stream and focused on the performance effects of increased purchasing integration and involvement (Glock and Hochrein, 2011; Schiele, 2005). Ellegaard and Koch (2012) also demonstrate the link between internal integration and cost-savings. Recently, the need to configure internal integration and supplier practices in line with the production system setup in order to attain desired levels of cost and strategic performance was highlighted (i.e. flexibility, quality and service levels) (Shou, Li, Park and Kang, 2018).

Scholars have also investigated how this integration can be achieved. Many focused on

the influence of the strategic decision-making process through the function's representation on the senior management team, as well as an incentive system for purchasing based on the overall firm performance (Ellram and Carr, 1994; Fitzpatrick, 1996; Flynn et al., 2010; Gadde and Håkansson, 1994; Pagell, 2004; Robertson, 1995; Watts et al., 1995). On the operational level, integration benefits from close and very frequent collaboration and communication between employees through meetings, conversations, IT-enabled information sharing, or trainings (Bals et al., 2009; Pagell, 2004). Furthermore, other functions acknowledge the importance of cross-functional alignment with purchasing as the marketing literature shows (Kahn and Mentzer, 1998; Song et al., 1996). Today, the debate in marketing is ongoing, as Toon et al. (2016) show with their discussion of marketing-purchasing integration.

Narasimhan and Das (2001) summarize and pronounce purchasing integration specifically as an internal firm initiative. They explained the dimensions of purchasing integration as part of the strategic planning process of a firm and “developing strong internal ties” (Narasimhan and Das, 2001, p. 596) through joint teams, shared information, and joint decision-making. This operationalization received wide attention and was further deepened in the literature (Foerstl et al., 2013; González-Benito, 2007). We build on Narasimhan and Das' (2001) definition and define purchasing integration as the involvement of purchasing in strategic planning activities, such as strategy meetings, as well as the contribution to the company through challenging demand and to optimization initiatives through supply market analysis.

### *2.3. Strategic purchasing performance*

The academic discussion of purchasing knowledge and purchasing integration has been an important part of the overall debate about the strategic role and performance of the purchasing department in firms. Ultimately, the purpose is to create competitive advantage. This point is especially true for firm- or function-level strategies, including purchasing (Carter and Narasimhan, 1996). Lawless (1989) point out that the functional strategy makes the difference

in firm performance overall. Carter and Narasimhan (1996) showed empirically that (next to essential inputs, such as competition level, pricing and positioning, or marketing) strategic purchasing accounts for 43% of the overall firm performance variance. Thus, the strategic decisions made by purchasing play a very important role in a firm's competitive advantage and, thus, a core part of purchasing performance (Carter and Narasimhan, 1996).

The first discussions on purchasing's strategic contribution started in the 1970s, of the function's administrative focus (Carter and Narasimhan, 1996). The first studies connected purchasing strategy to firm performance and discussed the shift of the function from tactical to strategic that evolved in the 1980s (Freeman and Cavinato, 1990; Pearson and Gritzmacher, 1990). Since then, strategic purchasing research has been broadened significantly but is predominantly conceptual or case based instead of empirically validated (Ellram and Carr, 1994). Carter and Narasimhan (1996) provided a very clear and fact-based definition of strategic purchasing performance and showed that purchasing and its strategy have a direct impact on firm performance. Consequently, researchers have increasingly investigated strategic purchasing factors (e.g., skills, cross-functional and cross-supply chain integration), as well as the effects of strategic purchasing on financial and market performance (Bracker and Pearson, 1998; Carr and Pearson, 1999; Carr and Smeltzer, 1997; Chen et al., 2004; Cousins et al., 2006). Another stream of closely connected literature discusses the function's evolution toward a strategic role using development models with distinct steps (Burt and Doyle, 1994; Freeman and Cavinato, 1990; Keough, 1993; Monczka et al., 2002; Reck and Long, 1988). Although the investigations used a different number of steps and taxonomies, most concluded with a continuous but slow development of the function toward strategic impact (Cousins et al., 2006). Tchokogué, Nollet and Robineau (2017) analyzed purchasing's strategic contributions in a systematic literature review of the last 40 years. They conclude that purchasing professionals must develop knowledge and skill to exploit acknowledged cost

contributions, while being prepared to constantly seek new strategic contribution opportunities from environmental dynamism.

Our literature review has shown that purchasing (when concerned with strategic tasks, such as make-or-buy decisions, supplier relationship management, new supply markets, risk management, and commodity strategies) supports firm performance. In addition, the function itself develops and the impact of integration on the firm's overall strategic decision-making and recognition of the function's contribution by senior management help purchasing further contribute to competitive advantage. To further complement this body of research, we focus on non-purchasing professionals who provide a neutral view on the strategic performance of purchasing. This perspective is especially valuable, as strategic purchasing performance is believed to contribute (next to firm performance) to adjacent functions' performance (Carter and Narasimhan, 1996). Furthermore, we focus on the effects that strategic purchasing performance has on the overall financial performance impact of purchasing instead of directly bridging the link to firm performance.

In doing so, we also differentiate our approach to strategic purchasing from previous work. We focus on the direct value contribution of tasks with visible outputs. Therefore, HR management and organizational structure are considered important, but enabling tasks with only a mediated impact on superior value contribution (Foerstl et al., 2013). In addition we also exclude operational aspects such as delivery and quality compliance (Krause et al., 2001). Hence, for the purpose of this study, we define strategic purchasing performance as purchasing's strategic contribution to the firm's overall business goals, purchasing's ability to innovate and also contribution to the firm's financials beyond classical savings, such as cash-flow improvements (Chen et al., 2004; Kerkfeld and Hartmann, 2012; Wuttke et al., 2013).

#### *2.4. Savings performance*

Looking at the overall purchasing performance, cost savings have been considered the

primary objective of purchasing. Especially in the recent (uncertain and ambiguous) global economic situation, the primary contribution of purchasing is often to optimize cost levels (Hartmann et al., 2012; Narasimhan and Das, 2001; Úbeda et al., 2015). Furthermore, cost savings are a primary and quantifiable measure of purchasing performance (Schiele, 2007), which often translates into a purchasing management steering model (Monczka and Morgan, 1994). The importance of high cost savings has increased in recent decades as the link to the overall buying firm performance has become clear and as the external spend-to-revenue increased significantly (Carr and Smeltzer, 1999b; Shin et al., 2000).

Cost savings through purchasing are divided into two groups: hard and soft savings (Nollet et al., 2008). Whereas soft savings cannot be measured directly (such as positive effects on manufacturing efficiency), they might eventually transform into monetary effects (Nollet et al., 2008). Hard savings, however, are directly quantifiable through concrete measurement data (Dmytrenko, 1997) and can be immediately linked to firm performance (so called bottom line impact). Hard cost savings are measured through the comparison of the final cost negotiated with a reference cost, such as the cost paid during a previous period (Monczka et al., 1979). Sometimes, another form of savings, cost avoidance, is brought forward where savings are measured against a potential future cost or a budget/market indication, which is also part of our measurement in cases where no historic cost baseline from previous periods exists (Dmytrenko, 1997). There has been some empirically validated evidence for the actual average size of hard cost savings, generally ranging between 3% to 15%, (Nollet and Beaulieu, 2003). However, the size of the cost savings varies based on the industry and sector in which a firm operates (Nollet and Beaulieu, 2003). Thus, we look at the relative cost savings performance of purchasing in one focal buying firm.

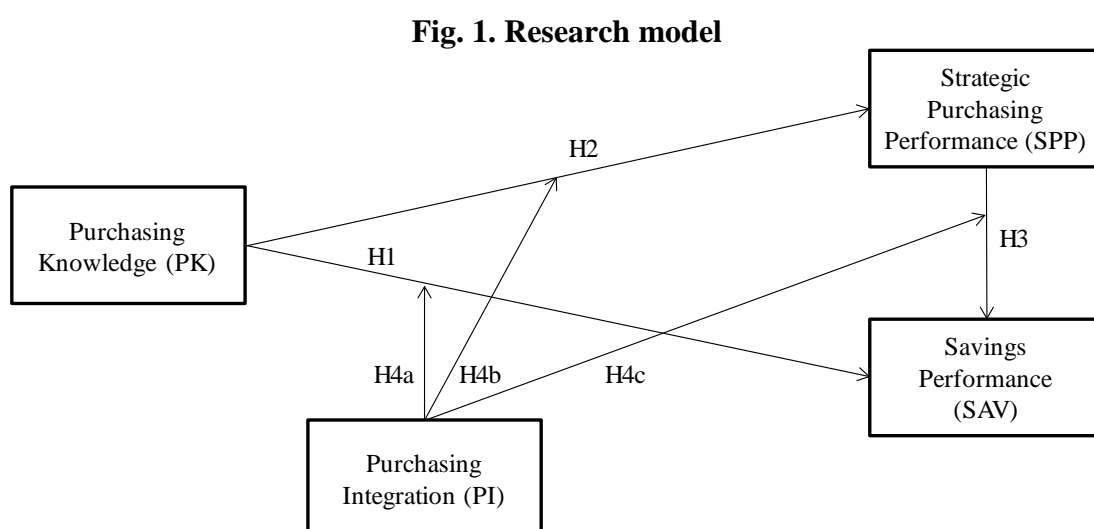
Many researchers have investigated which factors drive savings based on so-called maturity models. Organizations with further developed purchasing functions benefit from

higher levels of cost savings (Barry et al., 1996; Burt and Doyle, 1994; Keough, 1993; Paulraj et al., 2006). Keough (1993) estimate additional cost savings of 5–10% from progressing one stage in his maturity model. Also, the centralization of purchasing is also believed to drive savings through volume bundling (Karjalainen, 2011). However, thus far the direct impact of strategic performance on savings performance has not been a major part of these discussions.

To conclude, we focus on measuring hard cost savings in the form of real contracted savings achieved through the purchasing department and investigate the effects of purchasing knowledge, purchasing integration, and strategic purchasing performance. This narrow definition of cost savings has, to our knowledge, hitherto not been investigated, and the results are highly insightful to practitioners as they are based on real contract savings.

### 3. Hypothesis development

Organizations are seen as a bundle of resources which correctly linked and matching firm strategy can create superior performance (Barney, 1991). In essence, knowledge in purchasing can also be seen as a bundle of resources that helps to deliver high quality quickly at the lowest possible cost (Carr and Pearson, 2002).



In our research model, presented in Fig. 1, we include purchasing knowledge (PK) as the independent variable and strategic purchasing performance (SPP) and savings performance

(SAV) as the dependent variables. Purchasing integration (PI) is included as a moderator.

### *3.1. Purchasing knowledge and savings performance*

According to the knowledge-based view, knowledge is a firm's most strategic resource. Thus, more specifically, purchasing must possess knowledge and skills that can help to directly influence savings on materials and services by reducing the cost of the purchased goods in applying available purchasing levers. Such knowledge must comprise the supplier market as well as the commercial and technical knowledge which is to be combined and configured into appropriate sourcing tactics (Hesping and Schiele, 2016).

First, regarding knowledge of supplier markets, specific and extensive knowledge on supplier markets helps purchasing select the right suppliers and manage the firm's supply base. For example, a competitive bidding environment with healthy competition among suppliers might generate savings, but eventually, the knowledge for selecting the right suppliers for this competition will impact savings performance even more. This is the case as suppliers that want to enter a new market or protect market share might bid with calculated losses (Alexandersson and Hultén, 2006). Therefore, knowing which suppliers have a certain strategic intent and involving them in the bidding process to leverage potentially aggressive price bidding behavior might lead to cost savings. Further, Jofre-Bonet and Pesendorfer (2000) find that price bid levels of suppliers with capacity constraints tend to be higher than those of suppliers without such constraints. Proceedings involving suppliers with available capacity, therefore, might eventually lead to higher savings performance than proceedings with suppliers that are constrained.

Knowing the complexity of supplier markets enables purchasing to select the right parties for competition, find new suppliers, and retain existing suppliers to avoid a supply shortage. For example, repeated buying of the same goods and services requires purchasing to motivate suppliers to provide bids due to repeated bidders potentially becoming inactive if they had

little success in previous bids. As the number of bidders is the primary driver of the winning bid price, purchasing needs to maintain enough suppliers to repeatedly buy goods and services at competitive prices (Park et al., 2012). Thus, properly applying supplier market knowledge in supplier retention and motivation supports stronger savings performance.

Second, in terms of commercial knowledge, understanding various purchasing levers, such as negotiation tactics, bundling demand, and cost structure analysis, enables purchasing to pursue different strategies depending on the firm's power position and intent. For example, purchasing must properly analyze and understand the negotiation position the firm can take in specific situations. In a buyers' market for a commodity with global supply and overcapacity, purchasing usually designs tactics based on a strong power position whereas in an oligopoly environment with high technical specialization, purchasing might strive for design-to-cost collaborations together with the supply base. Hindriks et al. (2007) argue that without understanding the negotiation problem unfortunate steps in the negotiation cannot be avoided leading to potentially worse bids. Thus, applying commercial knowledge to negotiations likely ensures lower price bids and improved savings performance. Furthermore, purchasing might apply commercial knowledge to bundle volumes by coordinating internal demands to generate savings from leveraging buying power- Synergies of scale lead to lower unit costs and improved savings performance (Arnold, 1999; Maucher and Hofmann, 2013).

Third, regarding business understanding and technical skill, purchasing can generate a better understanding of the products or services to be bought by learning about them from the supplier (Chang et al., 2006) which can lead to improved financial performance (Verville et al., 2011). Such collaboration usually also leads to higher technical skills of purchasing professionals that positively affect company performance (Carr and Smeltzer, 2000). Thus, understanding the purchased products and services is important. For example, purchasing can confront suppliers with product-tear-down workshops and drive elimination of unnecessary



costs, such as replacing high-cost raw materials with a low-cost alternative, and thus enabling stronger savings performance.

Based on these arguments and in line with knowledge-based view, it can be derived that purchasing knowledge constitutes a strategic intangible resource (Grant, 1996). The capability of properly applying and combining such knowledge is essential for driving cost reductions and gaining (sustained) competitive advantage. Thus, we posit:

**H1.** Purchasing knowledge (PK) is positively related to savings performance (SAV).

### *3.2. Purchasing knowledge and strategic purchasing performance*

Purchasing knowledge not only affects savings performance but also boosts an organization's strategic purchasing performance (Carr and Smeltzer, 2000; Cousins et al., 2006). For example, a higher level of purchasing knowledge, such as extensive expertise in supplier markets, might foster a higher level of innovations as purchasing has access to simply more suppliers (e.g., from different geographies) that can be initiators and a source of innovations (Azadegan and Dooley, 2010). As a significant portion of a company's innovations can stem from its suppliers (Winter and Lasch, 2016), having the knowledge to properly manage the exploitation of such supplier-driven innovation potential increases strategic purchasing performance.

In addition, higher levels of purchasing knowledge and commercial skills might drive the development of strategic solutions to complex problems (Keough, 1993). For example, if the buying firm wants to solve the dilemma of extending payment terms with a supplier facing cash flow challenges, purchasing might leverage advanced commercial levers, such as supply chain financing (SCF), to achieve extended terms but provide a healthy cash flow for the supplier (Wuttke et al., 2013). By doing so, the purchasing organization improves strategic purchasing performance, going beyond classical savings by optimizing working capital across the supply chain (Wuttke et al., 2016). Moreover, implementing SCF typically improves the

trust, commitment, and profitability of supply chain partners as cooperation tends to get more intense (Gelsomino et al., 2016).

Understanding of the business environment drives strategic purchasing performance and impacts the firm's long-term goals (Carr and Smeltzer, 1997). In such cases, purchasing will derive balanced solutions that not only reduce costs but also support top-line growth and quality improvements that impact the firm's strategic goals (Carr and Pearson, 2002; Ketchen et al., 2014). For example, purchasing might agree with a supplier to raise sales provisions for acquiring customers for the focal firm (i.e., agree on a higher cost) if that supplier, in turn, acquires more customers or customers that buy products or services with higher margins to drive growth or profit. In line with Kogut and Zander (1992) the possession of heterogeneous and valuable knowledge bases (about the supply market) can be a major determinant of strategic purchasing performance and ultimately drive competitive advantage. Hence, summarizing the above, we stipulate.

**H2.** Purchasing knowledge (PK) is positively related to strategic purchasing performance (SPP).

### *3.3. The mediating role of strategic purchasing performance*

The effect of purchasing knowledge on strategic purchasing performance is also thought to have a financial impact. For example, innovations stemming from strategic purchasing performance can, in turn, lead to cost reduction via process or product improvements (Azadegan and Dooley, 2010; Munksgaard et al., 2014). These cost reductions from supplier market innovations drive savings performance and would not have been generated without strategic purchasing performance in the first place.

The cash flow improvements stemming from strategic purchasing performance can have spin-off effects on further savings performance. For example, if the buying firm has a lower cost of capital than its supplier and the supplier is capital constrained, then the supplier can

get access to cheaper funding via supply chain financing at the cost of capital of the buying firm (Pfohl and Gomm, 2009; Randall and Theodore Farris, 2009). This interest rate differential leads to reduced funding cost for the supplier's operations. These savings can be shared via lower pricing from the supplier to the buying firm thus increasing savings performance via strategic purchasing performance.

Further, purchasing knowledge about the business environment enables purchasing to choose between a competitive or cooperative buying approach (Carr and Pearson, 1999). Typically, increasing competition among suppliers also tends to increase the cost of the supplier's production (Watts et al., 1995). Thus, increasing competition might create savings in the short term but jeopardizes value creation in the long term (Humphreys et al., 2000). Thus, purchasing with deep knowledge of the business environment affects long-term targets as part of the strategic purchasing performance by balancing short-term savings with long-term cost reductions that impact savings performance (Blome et al., 2013; Juntunen et al., 2012; Tomino et al., 2012). Based on these arguments, we postulate:

**H3.** Strategic purchasing performance (SPP) mediates the positive effect of purchasing knowledge (PK) on savings performance (SAV).

#### *3.4. The moderating role of purchasing integration*

Securing its essential role to help goods and services being delivered in time at best possible cost via executing professional purchasing activities is a precondition in making purchasing a trustful partner for internal stakeholders. Via close alignment with internal stakeholders, purchasing turns into a key resource that provides major input in a firm's core processes (Keough, 1993). Purchasing also generates savings and bottom-line impact via high levels of purchasing integration (Flynn et al., 2010). Further, purchasing integration enables purchasing to gain access to key information to make decisions in line with corporate goals and be treated as important as the firm's other major functions (Freeman and Cavinato, 1990).

In contrast, poor integration of purchasing usually results in slow problem solving, poor information exchange, and low firm performance (Pagell, 2004). Therefore, high levels of integration put purchasing into a position to adjust the knowledge applied to generate savings, such as creating competition or striving for cost reductions versus sourcing innovation or enabling top-line growth and thus increasing the efficacy of the purchasing organization in firm performance (Baier et al., 2008; González-Benito, 2007). The more integrated purchasing is with its internal stakeholders and the more transparency purchasing has regarding the targets and financial situation of the stakeholders, the higher the impact purchasing can make on firm performance via savings, as well as strategic purchasing performance (Foerstl et al., 2013; Mackelprang et al., 2014).

Increased purchasing integration results in higher visibility along with strong senior management commitment and strengthened credibility (Kaufmann and Gaeckler, 2015), which facilitates the provision of necessary resources for increased purchasing effectiveness (Trent and Monczka, 1994). The availability of sufficient resources boosts not only purchasing effectiveness but also the development of new knowledge and of the function that might lead to further improvement in performance (González-Benito, 2007). Thus, purchasing integration amplifies the effect of purchasing knowledge on savings performance and strategic purchasing performance. According to the proponents of knowledge-based view, knowledge-based resources become even more valuable and difficult to imitate if they are applied in a socially complex environment (Grant, 1996; Argote et al., 2003). Thus, knowledge exploitation through complex purchasing integration processes across functions should further moderate the purchasing knowledge–performance link. Based on these arguments, we stipulate:

**H4<sub>a</sub>.** Purchasing integration (PI) moderates the effect of purchasing knowledge (PK) on savings performance (SAV).

**H4b.** Purchasing integration (PI) moderates the effect of purchasing knowledge (PK) on strategic purchasing performance (SPP).

Eventually, the higher the trust and integration between purchasing and its internal stakeholders, the more serious those stakeholders might consider purchasing's suggestions for long-term targets, cash flow optimization, and more serious and fundamental cost reduction, thus leading to higher savings performance via strategic purchasing performance. For example, purchasing might suggest replacing a certain product or component with an innovation from the supplier market, for example, replacing original equipment manufacturer (OEM) equipment with a standard low-cost product or component. Such a replacement would allow for stronger competition in the supplier market and potentially higher savings performance long-term via this innovation.

However, because such complex changes typically touch the core operation of purchasing's internal stakeholders and require the involvement of various stakeholders, the likelihood and extent of the savings performance generated via strategic purchasing performance will be higher with higher integration, alignment, and trust among the parties. Thus, we further hypothesize:

**H4c.** Purchasing integration (PI) moderates the effect of strategic purchasing performance (SPP) on savings performance (SAV).

### **3. Methodology and data analysis**

#### *3.1. Data collection*

In this study, the authors use extensive secondary data sets from a leading European energy company with operations across Europe in various business segments, such as electricity generation and heat production, electricity distribution, and sales, and a total annual turnover of more than EUR 17 billion. At the time of the study, the case company was

exposed to changes of energy landscape with dropping power prices and with that declining returns. Thus, the case company's focus since then has been on cost savings along with a strong focus on purchasing as the company's executive management had realized that a competitively low and flexible cost base is needed for the success of executing corporate strategy going forward. Based on this focus savings stemming from purchasing, also fueled by strategic purchasing performance creating not only short term but also sustainable cost reductions, is an important and coherent measure for the case company's intentions.

The data on the savings initiatives documents real contracted savings on a spend base of EUR 3 billion. While the availability of secondary data to test theoretical models is usually rare, it is increasing in importance and relevance in purchasing research (Ellram and Tate, 2016; Knight et al. 2016). Thus, we consider this study a contemporary and major contribution in the field. To the best of our knowledge most studies collect performance proxies based on primary survey data or not fully executed savings initiatives.

For this study, our unit of analysis is the 'procurement manager–internal client' dyad. In order to answer the research question we matched two existing data sets. The first data set is the results of an internal client satisfaction survey conducted by purchasing, and the other is an extensive purchasing database with information on executed savings initiatives entailing a significant amount of detail concerning the characteristics of the purchasing tasks such as old and new spend, direct and indirect spend, competitive and direct awards, as well as capital and operational expenditures. Furthermore, one of the authors worked in the purchasing organization from which the secondary data sets stem. Thus, the authors have relevant knowledge of the sources underlying the secondary data as recommended by Atkinson and Brandolini (2001) when using secondary data sets.

To obtain a view of the performance of the purchasing organization regarding purchasing knowledge (PK), purchasing integration (PI), and strategic purchasing performance (SPP), the

authors used the data from the internal client satisfaction survey that the company's purchasing organization distributed to internal clients. The respondents scored the different questions on a 10-point Likert scale where a higher score corresponded with higher satisfaction. As the purchasing units were rated by internal clients, the scores for PK, PI, and SPP do not entail self-serving or other social desirability biases (Crane, 1999).

The relevant sampling frame to respond to the survey were internal clients with frequent interaction with purchasing ("requesters") or internal stakeholders involved in procurement decision making. In total, 302 people ( $N$ ) were identified and invited to participate in the survey of whom 44% were managers and 56% were non-managerial employees. The survey was distributed online in 2015, and data were collected by sending multiple emails and follow-up phone calls. The initiative resulted in a sample of 179 ( $n$ ) respondents of whom 57% were managers and 43% non-managerial employees. This is an effective response rate of 59.3%. The authors calculated the statistical confidence of the survey results which can be considered accurate with a 95% confidence level and a calculated margin of error of 4.68%, corrected for population size (Isserlis, 1918)<sup>1</sup>. Furthermore, the authors tested for non-response bias by comparing answers to all items listed in Table 1 from early respondents ( $n_e = 102$ ) and late respondents ( $n_l = 77$ ). There were no statistically significant differences between the two groups ( $p$  values ranged from 0.154 to 0.985).

To assess the savings performance in this study, the authors used existing documentation of the company's purchasing initiatives in 2015. After the initiatives with incomplete data were eliminated, the remaining 946 initiatives totaling EUR 3 billion spend were used to operationalize savings performance (SAV) in this article.

In order to test our model, the two existing data sets had to be matched. In order to link

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<sup>1</sup>  $marginOfError = z * \sqrt{\frac{p(1-p)}{n}} * \sqrt{\frac{N-n}{N-1}} = 1.96 * \sqrt{\frac{0.5(1-0.5)}{179}} * \sqrt{\frac{302-179}{302-1}} = 0.0468$

both data sets we applied a simple and reproducible matching procedure. We first clustered the internal client survey and the savings initiatives by business units. We then sorted the clustered data sets based on when the survey was completed and when the savings initiative was registered. We only used data where the purchasing savings initiative was registered (started) in 2015, so that it would also correspond to the internal client satisfaction surveys collected during Oct and Dec 2015 that inquired about the calendar year 2015. As a result we obtained multiple savings initiatives per internal client (between 1 to 13). Thus, while multiple savings initiatives could be linked to one survey response, a particular savings initiative can only be linked with one internal client. After matching the data at the business unit level of analysis for each purchasing-client interface, we combined all matched data sets into one single data set totaling 946 matched ‘savings initiative-internal client’ responses. Hence, we are also capturing the variance in cost savings per business unit based on this approach.

Savings were all recorded at the end of 2015, so that the accumulation of savings per initiative is (partially) dependent on the starting date of the respective initiative. For instance if an initiative was started in May 2015 then savings did accumulate during May until the end of the year. Nevertheless, given that the savings initiatives and the corresponding survey all correspond to the 2015 calendar year there was no need to statistically control for the short phase-lag variation in the regression analysis.

### *3.4. Measures*

As the authors used an existing questionnaire, the items and constructs were pre-defined. The authors focused on three areas from this questionnaire – purchasing knowledge (PK), purchasing integration (PI), and strategic purchasing performance (SPP) – and confirmed the constructs based on a literature review and existing research. The literature foundation of each item can be found in the Appendix. In the next step, the constructs were then tested via



confirmatory factor analysis (CFA) for scale validity and reliability. Three items were excluded from further analysis due to low loadings in the initial CFA. The results of the CFA based on the remaining items are shown in Table 1.

**Table 1:** Construct development and confirmatory factor analysis results

Construct (Cronbach's alpha, composite reliability, average variance extracted)	Code	SL	<i>t</i> *	R <sup>2</sup>
Original questions measured on a 1- to 10-point Likert scale with 1 = "not satisfied at all" to 10 = "fully satisfied"				
<b>Purchasing knowledge</b> ( $\alpha = .869$ , CR = .869, AVE = .688)	<b>PK</b>			
<i>How satisfied are you with Purchasing's understanding of the business environment and technical knowledge?</i>	PK1	.807	12.350	.652
<i>How satisfied are you with Purchasing's commercial knowledge needed to run standard Purchasing processes such as Rfx, tenders, contracting?</i>	PK2	.825	12.721	.680
<i>How satisfied are you with Purchasing's knowledge of supplier markets to generate competition and/or find appropriate sources of supply?</i>	PK3	.856	13.417	.734
<i>How satisfied are you with Purchasing's knowledge in contract and claims management?*</i>	PK4	-----		
		-		
<b>Purchasing integration</b> ( $\alpha = .900$ , CR = .901, AVE = .752)	<b>PI</b>			
<i>How satisfied are you with Purchasing's involvement in joint optimization and standardization initiatives (e.g., input from supplier markets)?</i>	PI1	.867	14.043	.751
<i>How satisfied are you with Purchasing's involvement in challenging demand to ensure strategic contribution to company goals?</i>	PI2	.873	14.205	.763
<i>How satisfied are you with Purchasing's involvement in strategic planning processes and external spend planning?</i>	PI3	.862	13.924	.743
<i>How satisfied are you with Purchasing's involvement in follow-up of mutually agreed actions?*</i>	PI4	-----		
		-		
<b>Strategic purchasing performance</b> ( $\alpha = .855$ , CR = .861, AVE = .676)	<b>SPP</b>			
<i>How satisfied are you with Purchasing's contribution from innovations to generate competitive advantage (e.g., via new supplier markets, tooling, etc.)?</i>	SPP1	.723	10.586	.522
<i>How satisfied are you with Purchasing's contribution to optimize cash flow beyond classical Purchasing savings?</i>	SPP2	.872	13.506	.761
<i>How satisfied are you with Purchasing's contribution to support and develop long-term business goals?</i>	SPP3	.862	13.301	.744
<i>How satisfied are you with Purchasing's contribution in reducing total cost of ownership (TCO) for your business?*</i>	SPP4	-----		
		-		
Note: normed chi-square = 1.32 ( $\leq 2.0$ ); non-normed fit index = 0.99 ( $\geq 0.9$ ); comparative fit index = 0.99 ( $\geq 0.9$ ); root mean square error of approximation = 0.04 ( $\leq 0.08$ ); standardized root mean square residual = 0.05 ( $\leq 0.08$ ).				
* $p < .001$ .				
** dropped due to low loading.				

Model fit was supported by all relevant fit indices (Hu and Bentler, 1998). All factor loadings were high and statistically significant in addition to each  $R^2 > 0.5$ , which were well above the cut-off points (Hair, 1998). Thus, more than 50% of the items variance was explained by the respective construct (Chen and Paulraj, 2004); see Table 1. Further,

Cronbach's alpha (Cronbach, 1951; Nunnally and Bernstein, 1994), composite reliability (Bagozzi and Yi, 1988), and average variance extracted (AVE, Fornell and Larcker, 1981) all exceeded common thresholds indicating construct reliability and validity of the scales; see Table 1. Regarding discriminant validity, we determined whether the constructs shared more variance with their own measures than with the other constructs (Fornell and Larcker, 1981). The correlation matrix in Table 2, with the square root of the constructs' AVEs on the diagonal, reveals that discriminant validity was supported as the square root of all constructs' AVE is always higher than their respective correlations with other constructs.

**Table 2: Construct Correlations**

	<b>Mean</b>	<b>SD</b>	<b>PK</b>	<b>PI</b>	<b>SPP</b>
<b>PK</b>	4.109	.915	.829	.496	.430
<b>PI</b>	4.206	.913		.867	.437
<b>SPP</b>	3.698	.926			.822

To further test for discriminant validity, the authors conducted a chi-square difference test. Comparing the unconstrained model, where correlations between factors were freely estimated, with models where the correlation of all possible pairs of latent constructs was fixed to 1 subsequently. The results are shown in Table 3, documenting significant chi-square differences with worse model fit for all constrained models. Therefore, we found additional supporting evidence of the sufficient discriminant validity of the constructs (Bagozzi et al., 1991; Chen and Paulraj, 2004; O'Leary-Kelly and J. Vokurka, 1998).

**Table 3: Chi-square difference tests**

	<b><math>\Delta</math>DF</b>	<b><math>\Delta</math>Chi-square*</b>
corr(PK,SPP) = 1	1	222.69
corr(PK,PI) = 1	1	168.69
corr(PI,SPP) = 1	1	222.52
* $p < .001$ .		

For the savings performance, the authors used the existing documentation on the concluded savings initiatives for products and services. The savings performance (SAV) was calculated as the difference between the old and new spend documented in the data set.

Further, the matched data set included, among others, the following details that were used as control variables in the regression analysis:

- Type of product or service (that is, the direct and indirect spend). Direct spend was defined as spend specific to the industry, for example, for wind turbines and power transformers, whereas indirect spend related to areas, such as consulting and facility management, but also more technically-driven areas, such as scaffolding and underground works. The control variable was dummy coded with Indirect Spend = 0 and Direct Spend = 1.
- Type of funding, that is, capital expenditures (Capex) and operational expenditures (Opex). Capital expenditures usually define investments for larger projects, and operational expenditures are used for recurring operations and maintenance. The control variable was dummy coded with Capex = 0 and Opex = 1.
- Competitive bidding and direct award. Competitive bidding defined an award only after competition whereas a direct award was specified by selecting the supplier without competition due to other constraints. The control variable was dummy coded with Direct Award = 0 and Award after Competition = 1.
- Savings had also been very strictly calculated in the case company either via setting the baseline (old cost) by multiplying the planned volumes with (a) the old cost as the first option, or (b) if the old cost was not available, the planned cost that can be based on assumed budgets or indicative offers from the supplier market as the second option. The control variable was dummy coded with Planned cost/Budget = 0 and Old cost = 1.

### *3.3. Hypothesis testing*

To test the hypotheses, the authors conducted a moderated mediation analysis using the SPSS Macro PROCESS (Hayes, 2013). The results are shown in Table 4.

**Table 4:** Regression results exploring mediators and moderators of strategic purchasing performance and savings performance

		Controls only		Full model	
Outcome: Strategic purchasing performance (SPP) (n=946)		$\beta$	$p$	$\beta$	$P$
<i>Deal size (lg[old spend]), control</i>		<b>-.140</b>	<b>.000</b>	<b>-.084</b>	<b>.004</b>
<i>Type of product (direct material/service), control</i>		.046	.147	.045	.106
<i>Type of funding (Opex), control</i>		-.001	.969	.029	.288
<i>Type of award (after competition), control</i>		<b>.106</b>	<b>.001</b>	.038	.180
<i>Baseline (old cost), control</i>		.010	.750	-.003	.907
<i>Role (manager), control</i>		<b>.088</b>	<b>.005</b>	<b>.095</b>	<b>.001</b>
<i>Frequency (weekly), control</i>		<b>.161</b>	<b>.000</b>	<b>.104</b>	<b>.000</b>
<i>Frequency (monthly), control</i>		<b>.219</b>	<b>.000</b>	<b>.204</b>	<b>.000</b>
Purchasing knowledge (PK)	<b>H2</b>			<b>.265</b>	<b>.000</b>
Purchasing integration (PI)				<b>.290</b>	<b>.000</b>
Purchasing knowledge (PK) * Purchasing integration (PI)	H4 <sub>b</sub>			-.011	.711
F		10.535		37.757	
R <sup>2</sup>		.083		.308	
		Controls only		Full model	
Outcome: Savings performance (SAV) (n=946)		$\beta$	$p$	$\beta$	$P$
<i>Deal size (lg[old spend]), control</i>		-.063	.058	.045	.094
<i>Type of product (direct material/service), control</i>		<b>-.118</b>	<b>.000</b>	<b>-.159</b>	<b>.000</b>
<i>Type of funding (Opex), control</i>		<b>-.070</b>	<b>.029</b>	-.047	.064
<i>Type of award (after competition), control</i>		.054	.096	-.048	.064
<i>Baseline (old cost), control</i>		.048	.140	<b>.065</b>	<b>.014</b>
<i>Role (manager), control</i>		<b>.084</b>	<b>.008</b>	<b>.055</b>	<b>.031</b>
<i>Frequency (weekly), control</i>		<b>.188</b>	<b>.000</b>	<b>.103</b>	<b>.000</b>
<i>Frequency (monthly), control</i>		<b>.164</b>	<b>.000</b>	<b>.096</b>	<b>.001</b>
Purchasing knowledge (PK)	<b>H1</b>			<b>.307</b>	<b>.000</b>
Strategic purchasing performance (SPP)	<b>H3</b>			<b>.315</b>	<b>.000</b>
Purchasing integration (PI)				<b>.186</b>	<b>.000</b>
Purchasing knowledge (PK) * Purchasing integration (PI)	<b>H4<sub>a</sub></b>			<b>.091</b>	<b>.004</b>
Strategic purchasing performance (SPP) * Purchasing integration (PI)	<b>H4<sub>c</sub></b>			<b>.188</b>	<b>.000</b>
F		9.010		51.253	
R <sup>2</sup>		.071		.417	

The controls for role and frequency are significant for strategic purchasing performance (SPP) as well as savings performance (SAV) as dependent variable. The small difference indicates that managers and employees both have a similar view on strategic purchasing performance, but that managers tend to evaluate purchasing slightly better. Moreover, the less frequent an internal client interacts with purchasing, the more positive the evaluation of strategic purchasing performance. This might be explained by the fact that with more frequent interaction develops trust to voice a more critical opinion, which in turn resulted in a lower evaluation. Still these effects of both control variables are to be considered minor since the

insertion of the control variable does not affect the significance of our main effects. For strategic purchasing performance (SPP) also deal size is significant and for savings performance (SAV) we found type of product to be significant. Still, controlling for these variables does not impact the significance of our main effects.

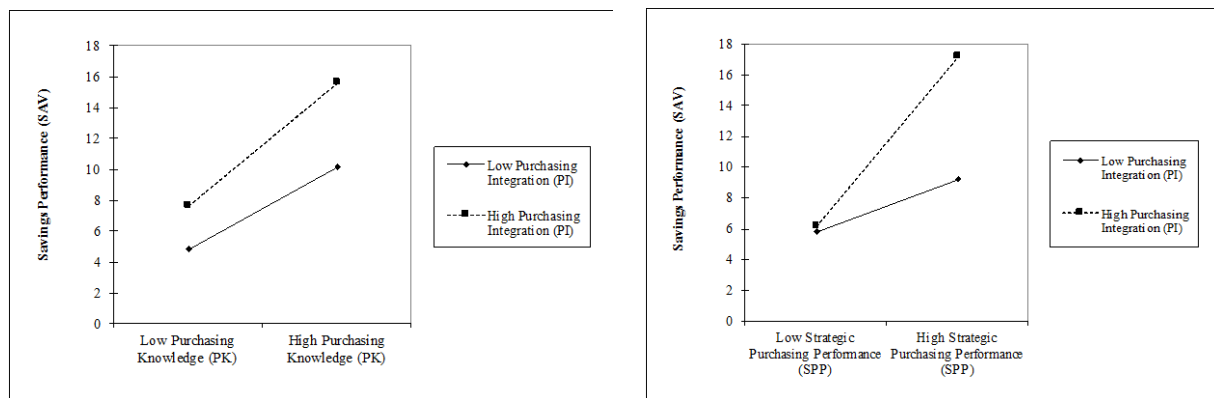
H1 and H2 stipulated a direct impact of purchasing knowledge (PK) on savings performance (SAV) and strategic purchasing performance (SPP), respectively. Both hypotheses were supported (H1:  $\beta = 0.316, p < 0.001$ ; H2:  $\beta = 0.282, p < 0.001$ ). H3 stipulated a direct effect of strategic purchasing performance (SPP) on savings performance (SAV) mediating the impact of purchasing knowledge (PK). This hypothesis is also supported (H3:  $\beta = 0.345, p < 0.001$ ). H4<sub>a/b/c</sub> claimed a moderating role of purchasing integration. Only the effects on savings performance were found to be moderated; thus, only H4<sub>a</sub> and H4<sub>c</sub> were supported (H4<sub>a</sub>:  $\beta = 0.110, p < 0.001$ ; H4<sub>c</sub>:  $\beta = 0.169, p < 0.001$ ).

To further test the conditional direct and indirect effects of purchasing knowledge (PK), we obtained 95% confidence intervals (CI) from bias-corrected bootstrapping by drawing 10,000 samples from the underlying data. The effects are considered statistically significant if the 95% CI does not contain zero. The results of this analysis are presented in Table 5, showing a partial mediation with a conditional direct and indirect effect of purchasing knowledge (PK) on savings performance via strategic purchasing performance (SPP). To confirm and illustrate the moderating effects, we graphed the significant interaction effects following procedures set forth by Aiken and West (1991) and Dawson (2014); see Fig. 2.

**Table 5:** Conditional direct and indirect effect of purchasing knowledge on savings performance via strategic purchasing performance

PI	Direct effect			Indirect effect		
	95% CI			95% CI		
	B	lb	ub	B	lb	ub
-1 SD (3.292), Mediocre integration	3.005	2.213	3.797	0.549	0.372	0.775
Mean (4.206), Good integration	3.695	2.969	4.421	1.004	0.727	1.360
+1 SD (5.118), Excellent integration	4.384	3.453	5.316	1.433	0.948	2.049

*Note:* CI = confidence Interval; lb = lower bound; ub = upper bound.



**Fig. 2. Interaction charts**

In all models, multi-collinearity did not affect the results. Variance inflation factors ranged between 1.018 and 1.557 and thus were well below the recommended level of 10 (Hair et al., 1998). The summary of all hypothesis tests is shown in Table 6.

**Table 6: Results of hypotheses testing**

Summary of Hypotheses	Proposed direction	Results
<b>H1</b> Purchasing knowledge is positively related to Savings Performance.	+	supported
<b>H2</b> Purchasing knowledge is positively related to Strategic Purchasing Performance.	+	supported
<b>H3</b> Strategic purchasing performance is positively related to savings performance, partially mediating the effect of purchasing knowledge on savings performance.	+	supported
<b>H4<sup>a</sup></b> The effect of purchasing knowledge on savings performance is moderated by purchasing integration.	+	supported
<b>H4<sup>b</sup></b> The effect of purchasing knowledge on strategic purchasing performance is moderated by purchasing integration.	+	not supported
<b>H4<sup>c</sup></b> The effect of strategic purchasing performance on savings performance is moderated by purchasing integration.	+	supported

#### 4. Discussion and conclusion

This study aimed at investigating how purchasing knowledge can enhance the strategic performance and savings performance of purchasing and how the two performance dimensions relate to each other, while considering purchasing integration as a moderator. According to the knowledge-based view of the firm, purchasing knowledge and the proper application and configuration of such knowledge should drive performance. Further, purchasing integration should amplify those effects.

Our findings support the positive impact of purchasing knowledge on both performance

dimensions as derived from the literature. Further, the results also suggest that strategic purchasing performance mediates the impact of purchasing knowledge on savings performance and that the direct and indirect effects of purchasing knowledge on savings performance is moderated by purchasing integration. Below, we elaborate on the findings and provide theoretical and managerial implications.

#### *4.1. Theoretical implications*

First, we offered a holistic definition of purchasing knowledge, covering the main areas, such as commercial knowledge, technical knowledge, and supplier market knowledge. Such holistic definition also supports recent research which showing that purchasing levers and their application are not to be treated in isolation but as a combination appropriate to the respective situation of the buying firm (Hesping and Schiele, 2016). We then tested the relationship of purchasing knowledge to real contracted savings by conducting regression analysis on extensive secondary data. Thus, this study closes a gap, as typically the impact of purchasing performance was tested and supported on primary perceptual performance scales instead of on secondary data with objective financial metrics.

Previous supply chain research suggested that higher levels of knowledge positively influence financial performance (Birou et al., 2011; Fugate et al., 2009; Germain et al., 2001). This study confirms those findings with significant positive relations between purchasing knowledge and both performance dimensions. Thus, we extend the understanding of the knowledge–performance link specifically to purchasing knowledge and its impact on savings performance as a major contributor to financial performance and the impact on strategic purchasing performance.

Moreover, by showing the mediating effect of strategic purchasing performance on savings performance, this study adds additional empirical evidence that the strategic

contribution of purchasing beyond classical cost reductions eventually also impacts financial performance, thereby also confirming insight from recent research on generating supernormal profits from strategic purchasing (Saxena et al., 2013). In addition, we further confirm the moderating role of purchasing integration (Narasimhan and Das, 2001) but extend the insight generated by this moderator role to sole financial performance, that is, savings performance. This finding is valuable as it emphasizes that purchasing integration pays off with a direct financial return and not only on operational aspects investigated via composite constructs, such as manufacturing performance (Narasimhan and Das, 2001), supply chain responsiveness (Williams et al., 2013), or logistics performance (Salema and Buvik, 2016).

Interestingly, there was no significant moderation effect of purchasing integration on the relation between purchasing knowledge and strategic purchasing performance. This result might be explained with the rationale for a similar finding provided by González-Benito et al. (2016). Strategic purchasing performance captures only the purchasing dimension of performance and not necessarily the whole strategic performance effect generated by the purchasing function. Having said this, purchasing integration might still moderate the knowledge/ strategic performance link, but the nature of the dependent variable might not have captured it. This interpretation would also be supported by the fact that the indirect effect of purchasing knowledge on savings performance (via strategic purchasing performance) is significantly moderated by purchasing integration.

#### *4.2. Managerial implications*

As the results are based on an analysis of extensive real-life secondary data, the findings also provide highly relevant insight for (purchasing) executives. This also matches the requirements of the debate around evidence-based management. Pfeffer and Sutton (2006) argue that one of the reasons executives mistrust evidence is that too much information



available, but not enough good reliable evidence. Particularly executives cannot easily transfer findings from perceptual performance research into real life implications as procurement performance is often assessed in savings. Therefore, our study contributes to the stream of evidence based management and helps to link research and practice.

Overall, the study supports the outstanding role of knowledge in purchasing to create sustainable competitive advantage and an optimal cost base via strategic purchasing performance and savings performance. Along with the moderating effect of purchasing integration, executives should continue to consider purchasing as pivotal for a company's success and ensure close internal integration between internal clients and purchasing. Looking at purchasing knowledge more specifically and its significant positive impact on savings and strategic purchasing performance, executives are advised to invest in the knowledge-building and learning capabilities of purchasing.

In addition, the insight that strategic purchasing performance mediates the effect of purchasing knowledge on savings performance and thus also creates additional cost reductions should drive purchasing executives to focus even more on strategic performance as those efforts will ultimately affect the bottom line. In this study, the financial impact of strategic purchasing performance is even slightly higher than the direct impact of purchasing knowledge which emphasizes the shift toward the more strategic impact of purchasing.

In terms of monetary impact, an improvement in purchasing knowledge by one unit results in a direct savings increase of approximately four percent and an additional indirect effect via Strategic Purchasing Performance of one percent savings performance. The mean of the savings initiatives being three million Euro, these five percent savings performance improvement lead to 150.000 Euro cost reduction. Assuming such linear effects for +/- 1 S.D. to the mean (see Table 2) and no decreasing marginal utility from knowledge in that range, the difference between a case with lower purchasing knowledge (i.e. -1 S.D. to the mean) and

a case with higher purchasing knowledge (i.e. + 1 S.D. to the mean) can be around 9% savings equaling 270.000 Euro on an averaged sized deal. It is especially worthwhile noting that this effect is amplified significantly by the level of purchasing integration with a combined direct and indirect effect of purchasing knowledge of approximately 3,5% savings per one unit improvement in case of low integration versus approximately 6% combined effect on savings in case of high integration (see Table 5). Thus, the savings difference between a case with low purchasing knowledge and low integration (i.e. -1 S.D. to the mean for both independent variables) and a case with high purchasing knowledge and high purchasing integration (i.e. +1 S.D. to the mean for both independent variables) can mount up to 13% equaling 390.000 Euro savings difference on an averaged sized deal.

The results also reveal that high levels of purchasing integration are a true catalyst for savings performance. Looking at the direct effect of purchasing knowledge, savings performance is improved by more than 50% moving from mediocre to excellent purchasing integration. This amplification is even stronger for the mediation via strategic purchasing performance as savings performance based on the indirect effect of purchasing knowledge is more than doubled when mediocre purchasing integration is compared with excellent purchasing integration. With higher purchasing integration, the indirect impact of purchasing knowledge on savings performance is gaining significant weight accounting up to almost one third of the total savings performance. Thus, we also provide a strong indication that executives should incentivize the collaboration between purchasing and its internal stakeholders as this will lead to outstanding savings performance.

The insights of this study should reassure executives that there is no trade-off to be made between purchasing savings on the one hand and strategic contribution of purchasing on the other hand. The results show that these two performance dimensions are complementary and can enable superior performance in a highly integrated organization.

#### *4.3. Limitations and further research*

Naturally, in addition to the strength and unique feature of deriving insight from analysis of extensive secondary data with real financial performance metrics, this study has certain limitations that offer options for further research. First, we analyzed data from only a single large European utility which might limit the external validity of the results in terms of their relevance for other geographies and industries. Therefore, we suggest similar studies should be expanded to other regions of the globe, as well as other industries, to allow for wider generalizability. Such studies could even be expanded to analyze differences across industries and geographies to further deepen the understanding of how purchasing knowledge and integration drive performance based on specific environmental factors. Second, we analyzed data from 2015 only. Therefore, the results reflect only the status quo in that year and do not allow for any conclusion regarding development over time. Therefore, we suggest the analysis of longitudinal data in future research to understand whether the effects we found can also be sustained over time.

In addition, as we use existing data sets of a case company, we could not fully implement validity and reliability requirements of primary data collection ex-post. The secondary data analysis conducted in this article reduced the impact of common method variance on the results and eliminated the effect of the perception of one or few informants about their company (Podsakoff et al., 2003). However, secondary data has the issue – in this case – that we as researchers could not influence the design of the survey instrument ex-ante. Thus, we compared the applied survey instrument with established construct scales in purchasing research (see Appendix 1). We believe that our secondary data study, together with other notable exceptions (Van Poucke et al., 2016; Vos et al., 2016), can pave the way for better use of idiosyncratic firm data sets (e.g. for longitudinal comparisons). Therefore, leveraging more buying firm data-sets could open up further opportunities for evidence-based

management addressing pressing practical matters that are also of theoretical and scholarly relevance.

Also, certain dimensions were discarded in this study and could be explored further in future research. For example, purchasing knowledge could be broadened to purchasing's skill of building relations with internal users, supplier and other stakeholders. Additionally purchasing integration could be focused further on the respective relationship management with internal stakeholders. Finally, our findings could be strengthened further by extending research to realized savings as suppliers usually try to generate additional margins during contract execution, for example, via claims management. Thus, such extension of this study would generate awareness of whether contracted savings performance can be retained over the contract duration or whether value leakage eventually diminishes the realized savings.

These limitations should be addressed in future research, but they do not jeopardize the results of this study. Therefore, we conclude that this study adds theoretical insight into how to attain abnormal performance as focal buying firm. The study provides managerial support with highly robust and practically relevant insight into how to drive bottom-line impact from purchasing knowledge and integration in the short and long term.

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## Appendix

Survey items	Literature Source	Reasoning for matching
<b>Strategic purchasing performance (SPP)</b>		
How satisfied are you with Purchasing's contribution from innovations to generate competitive advantage (e.g., via new supplier markets, tooling, etc.)?	Part of 'Operational Performance' in Kerkfeld & Hartmann (2012).	This item has been used in previous research. Even though it is part of operational performance in the mentioned article fitting it into our "strategic purchasing performance" construct is justified in the article aper.
How satisfied are you with Purchasing's contribution to optimize cash flow beyond classical Purchasing savings?	Extensively researched in Wuttke, Blome, Foerstl & Henke (2013)	Previous research did not define this as item yet – though in the mentioned article cash flow optimization via purchasing is described and its strategic nature in impacting performance is displayed.
How satisfied are you with Purchasing's contribution to support and develop long-term business goals?	Part of 'Strategic Purchasing' in Chen, Paulraj & Lado (2004)	Both items target the same aspect of purchasing so we believe fitting it into our strategic purchasing performance construct works well.
<b>Purchasing knowledke (PK)</b>		
How satisfied are you with Purchasing's understanding of the business environment and technical knowledge?	Purchasing professionals have the technical capabilities to help our suppliers improve their processes and products, in Carr & Smeltzer (2000)	Both items target the technical capability in purchasing representing a similar aspect of purchasing knowledge.
How satisfied are you with Purchasing's commercial knowledge needed to run standard Purchasing processes such as Rfx, tenders, contracting?	Purchasing professionals have the necessary skills to improve the firm's total cost of doing business with the firm's suppliers, in Carr & Smeltzer (2000)	Both items target the commercial capability in purchasing representing a similar aspect of purchasing knowledge.
How satisfied are you with Purchasing's knowledge of supplier markets to generate competition and/or find appropriate sources of supply?	Purchasing professionals have the necessary skills to monitor and interpret changes in the supplier market/product base, in Carr & Smeltzer (2000)	Both items target purchasing's way of working with the supplier market representing a similar aspect of purchasing knowledge.
<b>Purchasing integration (PI)</b>		
How satisfied are you with Purchasing's involvement in joint optimization and standardization initiatives (e.g., input from supplier markets)?	The extent to which purchasing recommends and impacts changes in end products and inputs, in Narasimhan & Das (2001)	Changes in end products or inputs based on supply market analysis as an example of a joint optimization and added value from purchasing integration.
How satisfied are you with Purchasing's involvement in challenging demand to ensure strategic contribution to company goals?	The extent to which purchasing is measured/rewarded on strategic contributions (new products/technologies) vs cost and efficiency metrics alone), in Narasimhan & Das (2001)	Both items target the strategic contribution of purchasing to company goals representing a similar aspect of purchasing integration.
How satisfied are you with Purchasing's involvement in strategic planning processes and external spend planning?	The extent to which purchasing regularly attends strategy meetings, in Narasimhan & Das (2001)	Both items target purchasing's involvement in strategic planning representing a similar aspect of purchasing integration.

